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**Paas et al.**

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(54) **OVERCAP FOR AND A METHOD OF ACTUATING A VOLATILE MATERIAL DISPENSER**

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***B65D 83/22*** (2006.01)

(52) **U.S. Cl.**
CPC ..... ***B65D 83/206*** (2013.01); ***B65D 83/201*** (2013.01); ***B65D 83/22*** (2013.01)
USPC ..... **222/1**; 222/402.13; 222/402.15

(58) **Field of Classification Search**
CPC ... B65D 83/201; B65D 83/205; B65D 83/206
USPC ..... 222/402.13, 402.1, 402.15, 182
See application file for complete search history.

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*Primary Examiner* — Daniel R Shearer

(57) **ABSTRACT**

An overcap for a volatile material dispenser includes a housing adapted to be mounted on a container. The container has a valve stem with a discharge end. The overcap includes a valve-connecting portion adapted to engage the valve stem and a fixture that extends from the valve-connecting portion. The overcap further includes a trigger attached to the housing by a hinge that is disposed at or below a plane formed by the fixture. A contact portion is disposed in the trigger for interacting with the fixture and applying pressure to the valve-connecting portion to actuate the valve stem.

**20 Claims, 10 Drawing Sheets**

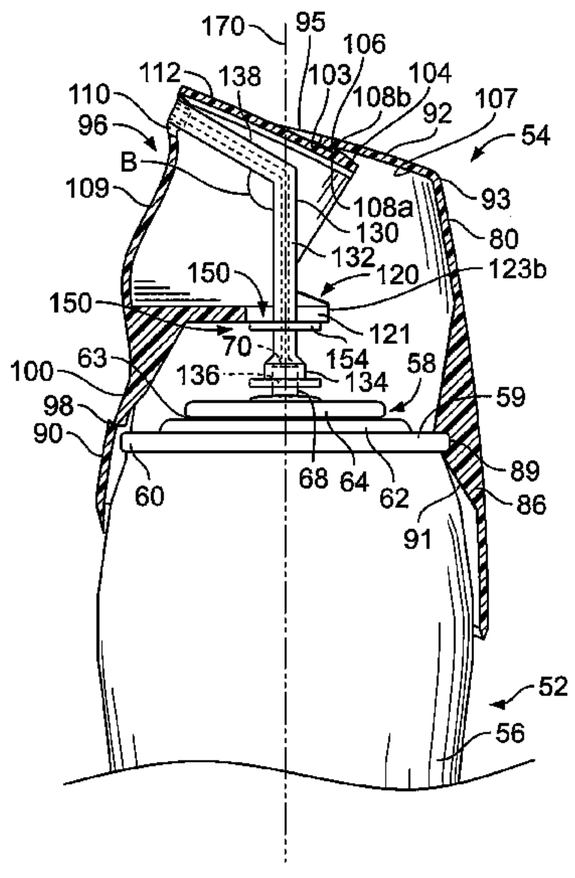

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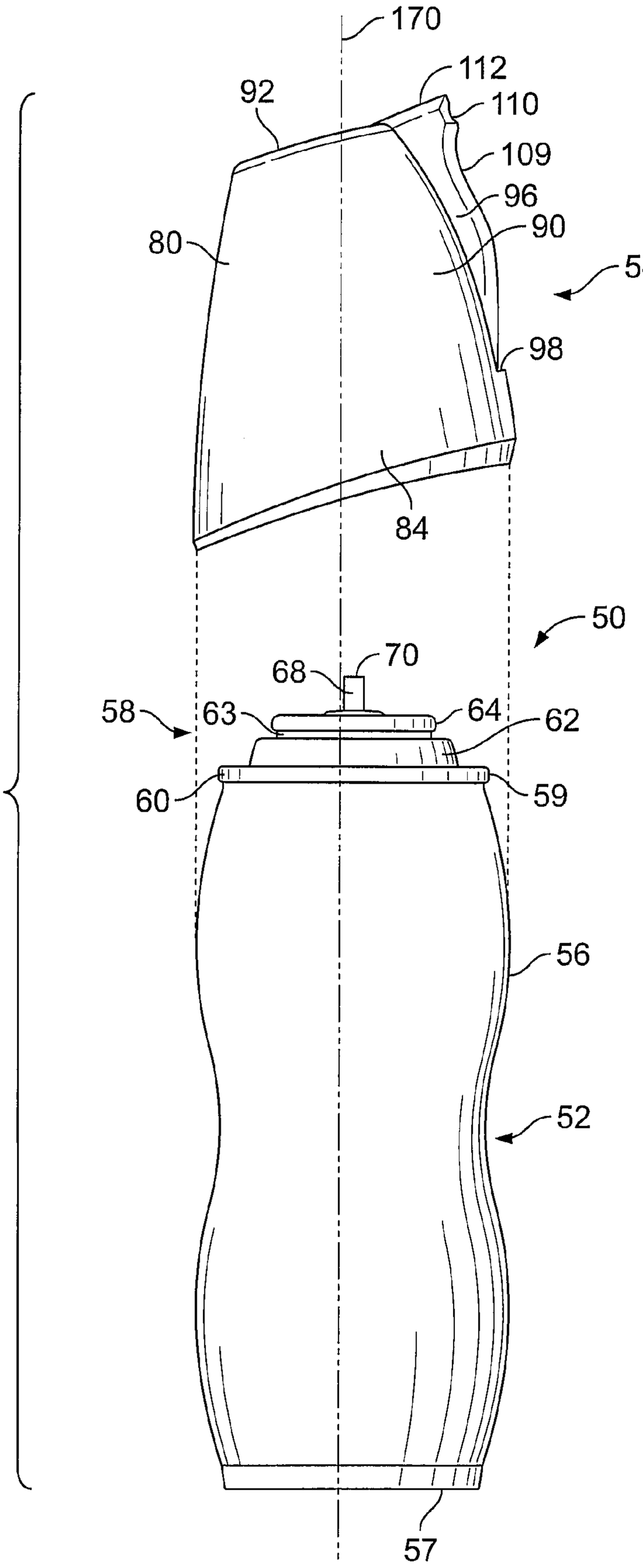
FIG. 1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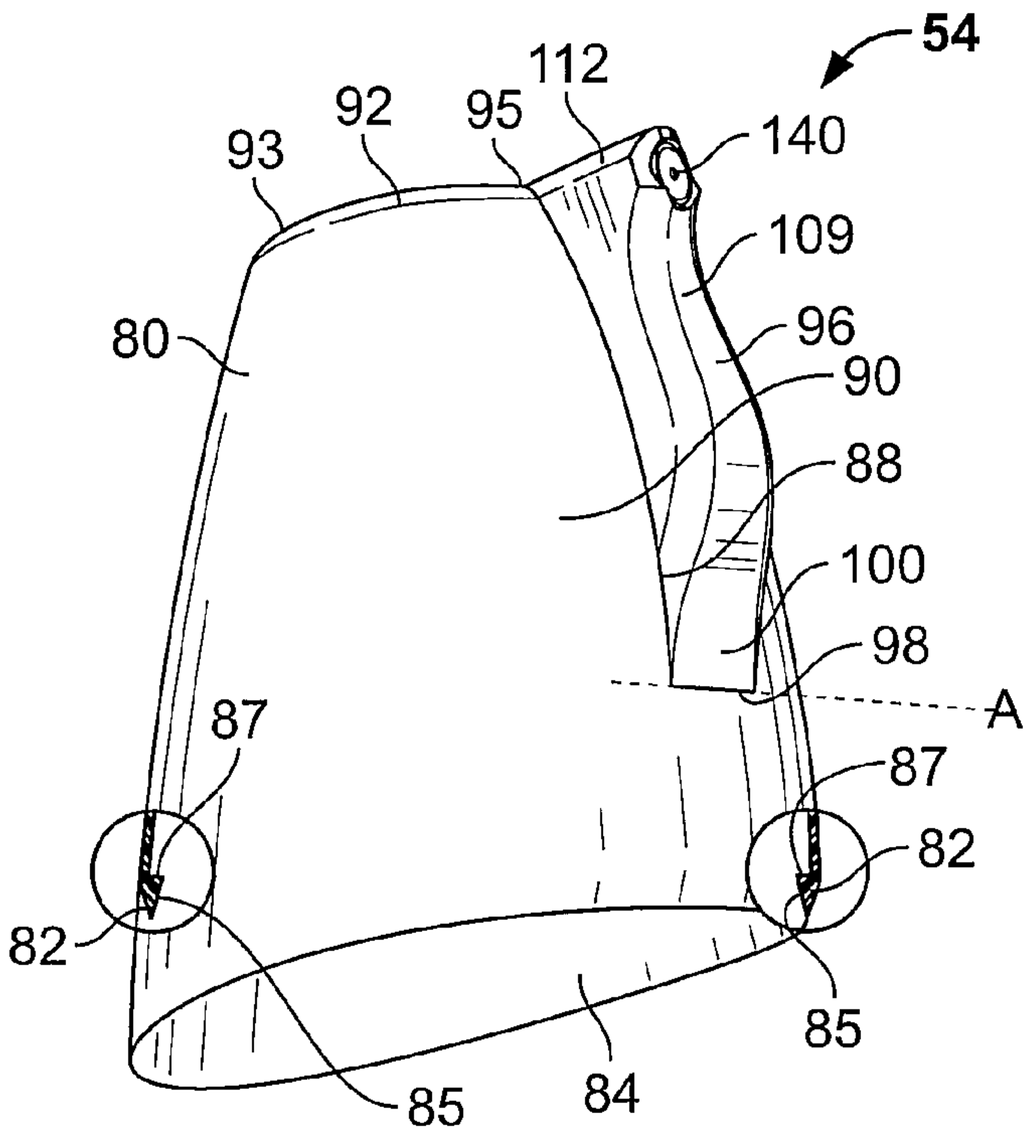
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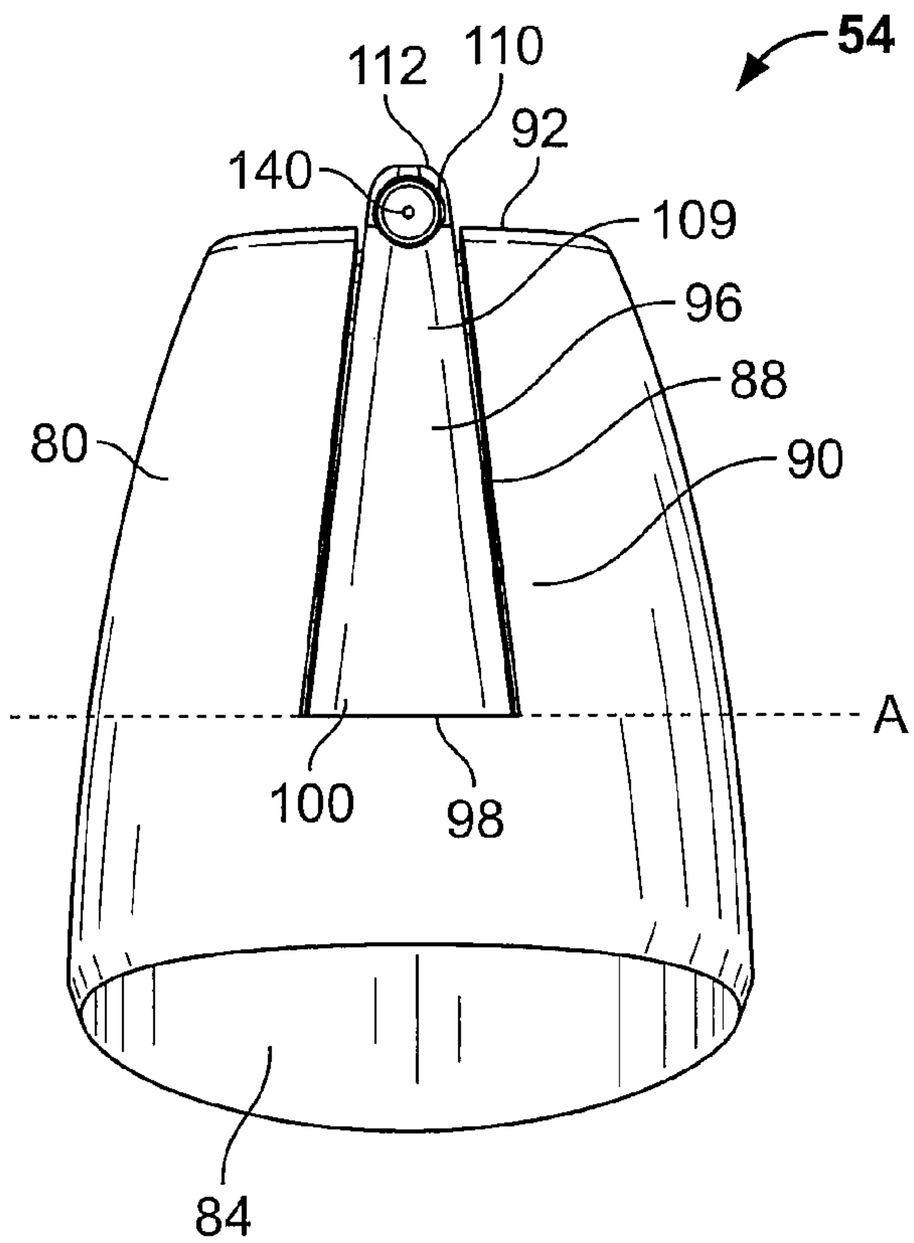
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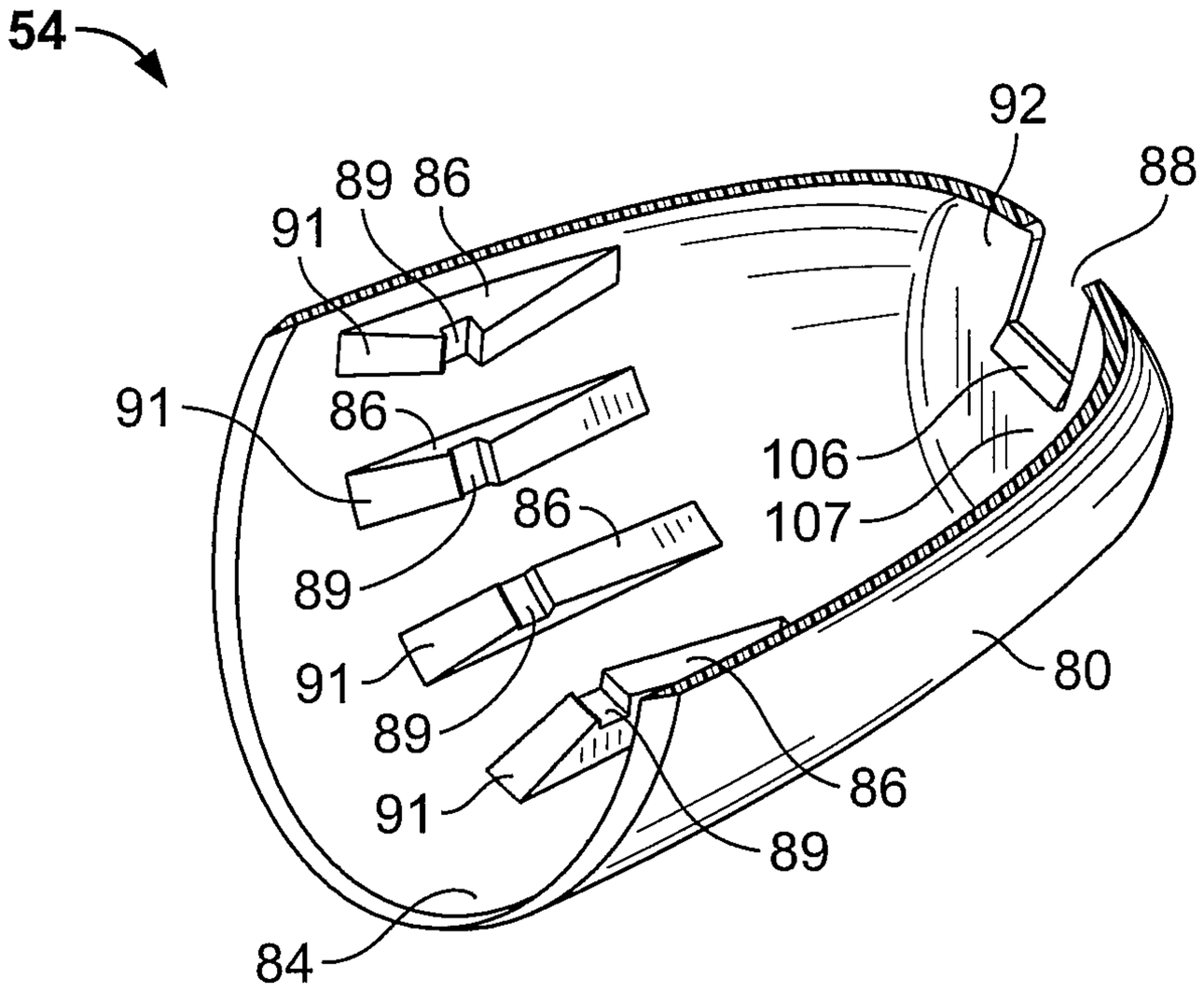
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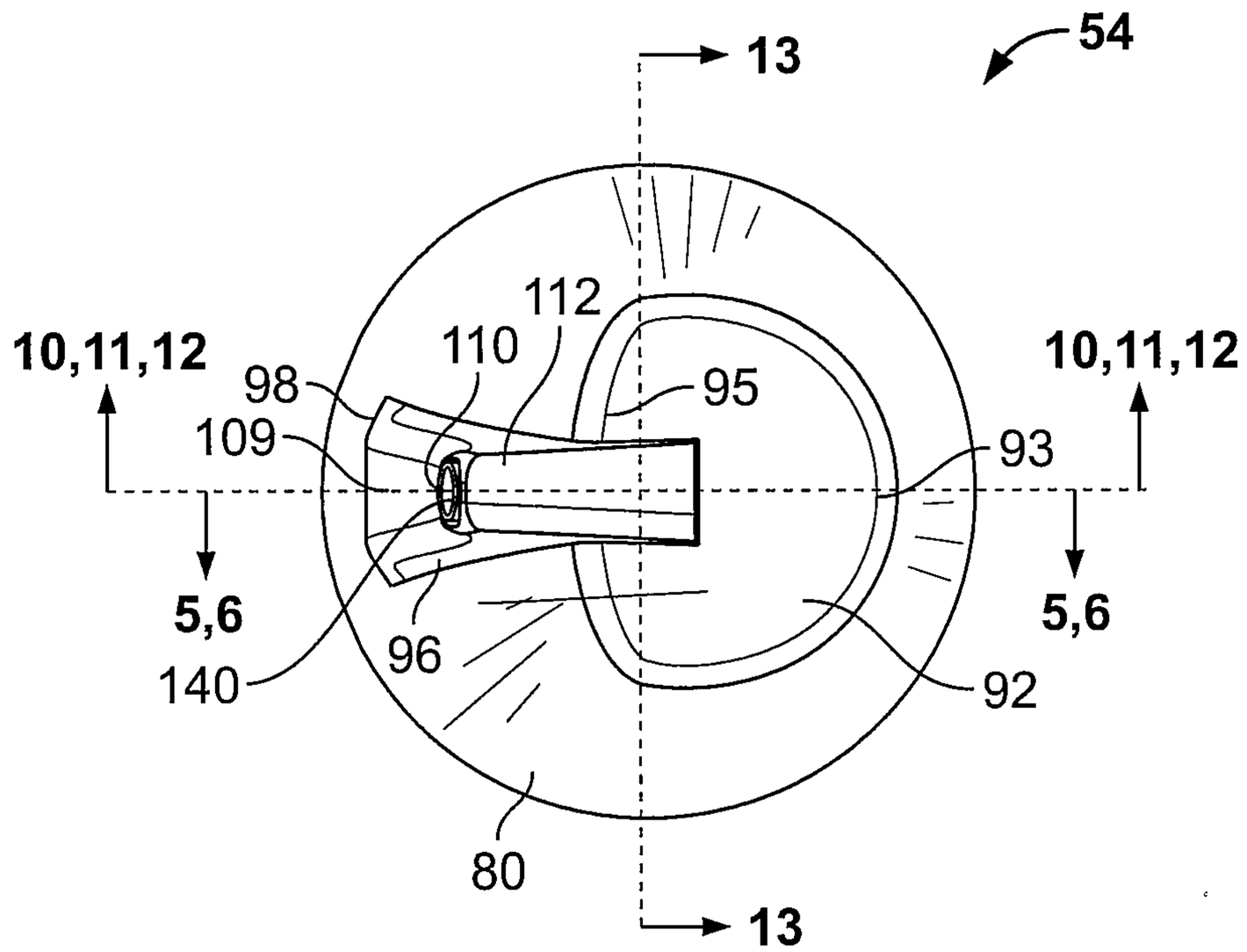
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FIG. 7

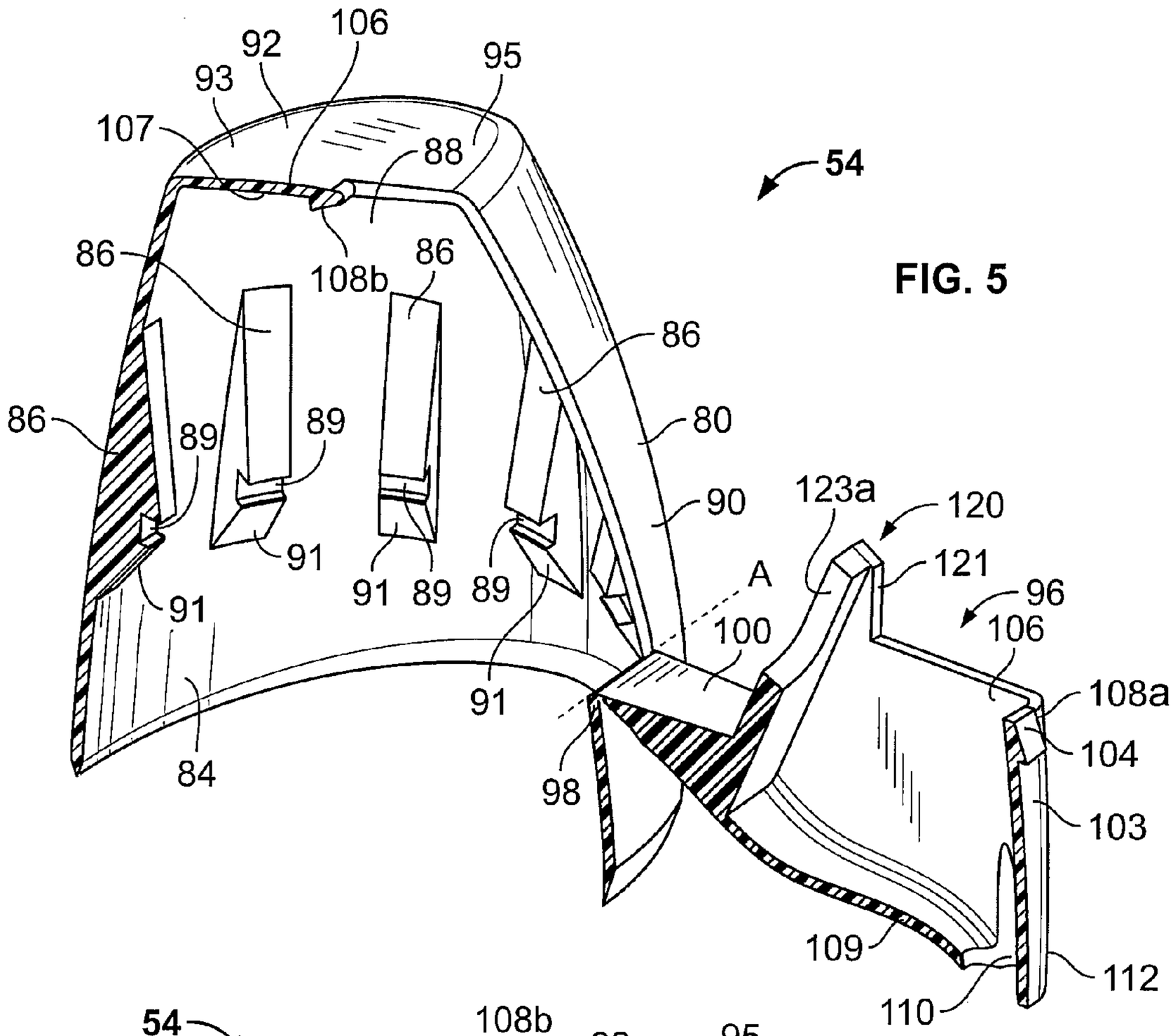
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FIG. 5

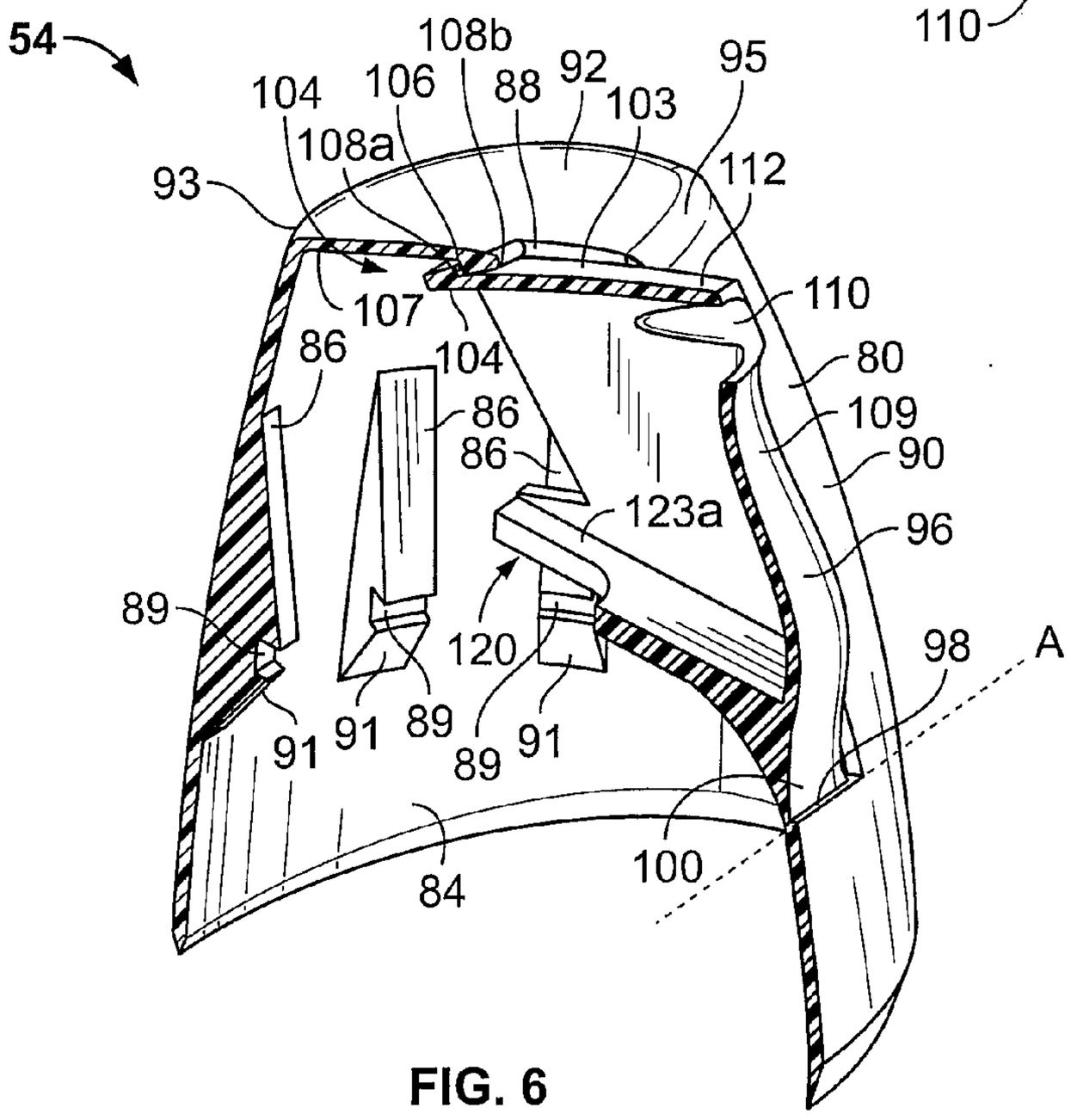
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FIG. 6

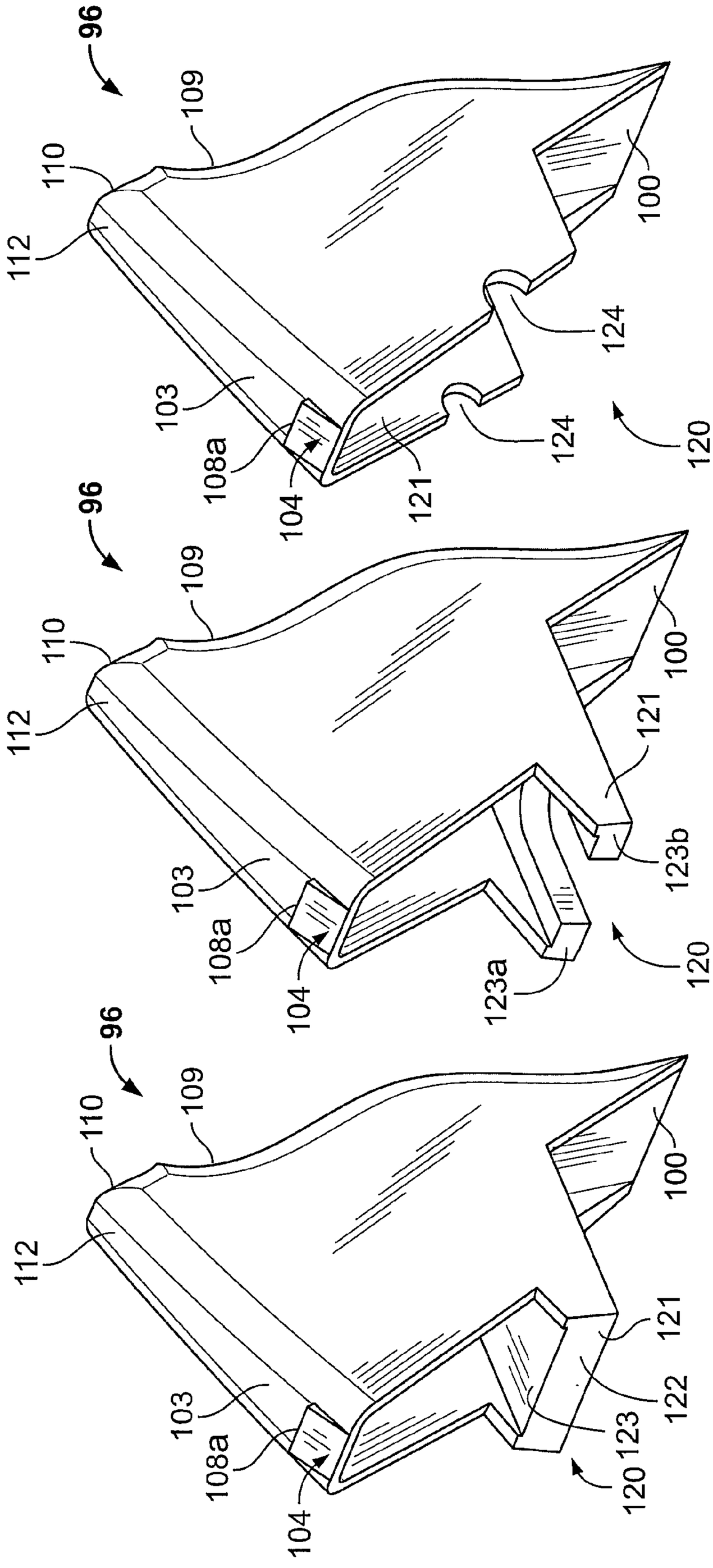


FIG.9

FIG.8B

FIG. 8A

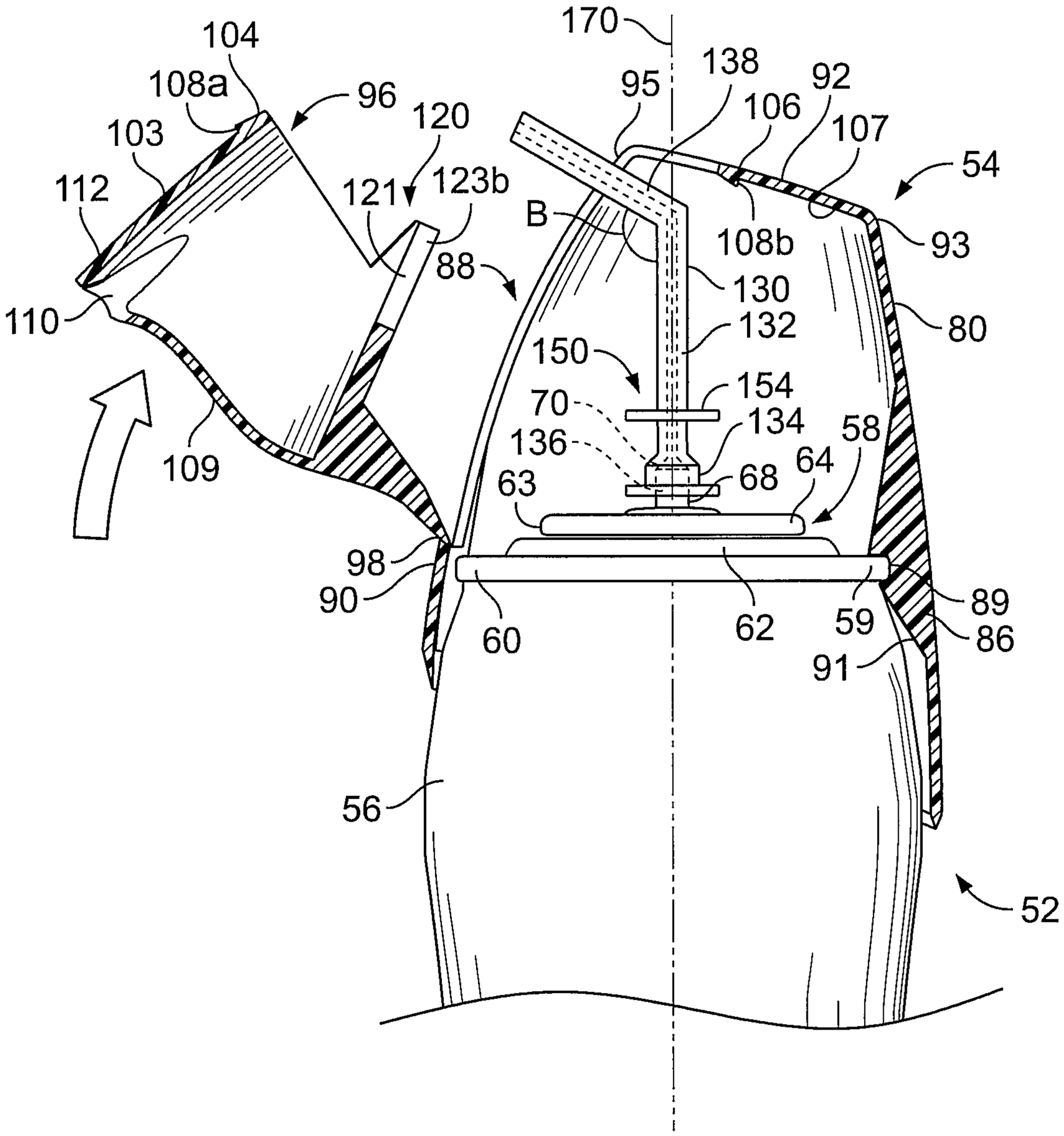
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FIG. 10A

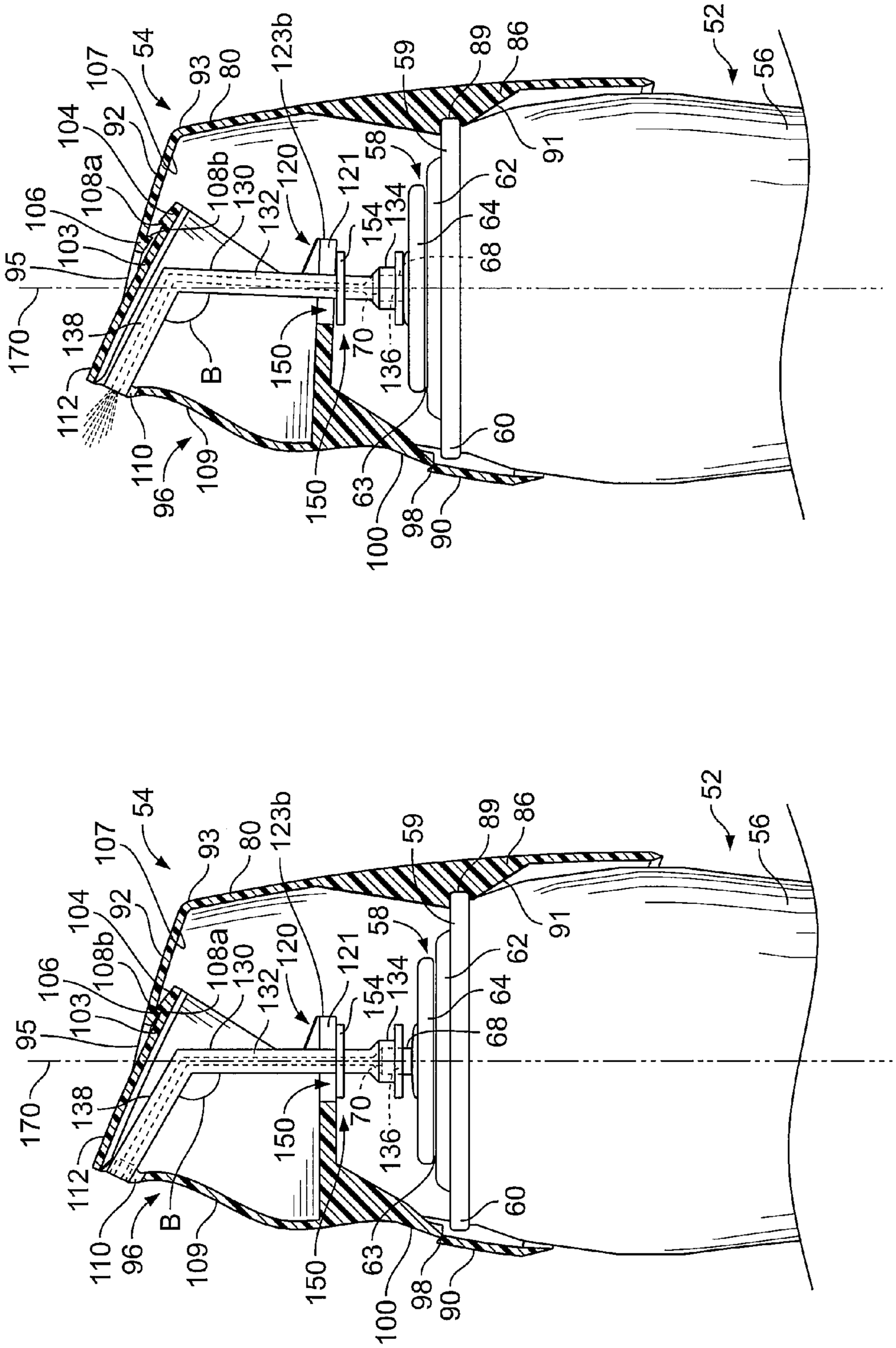


FIG. 10B




FIG. 10C

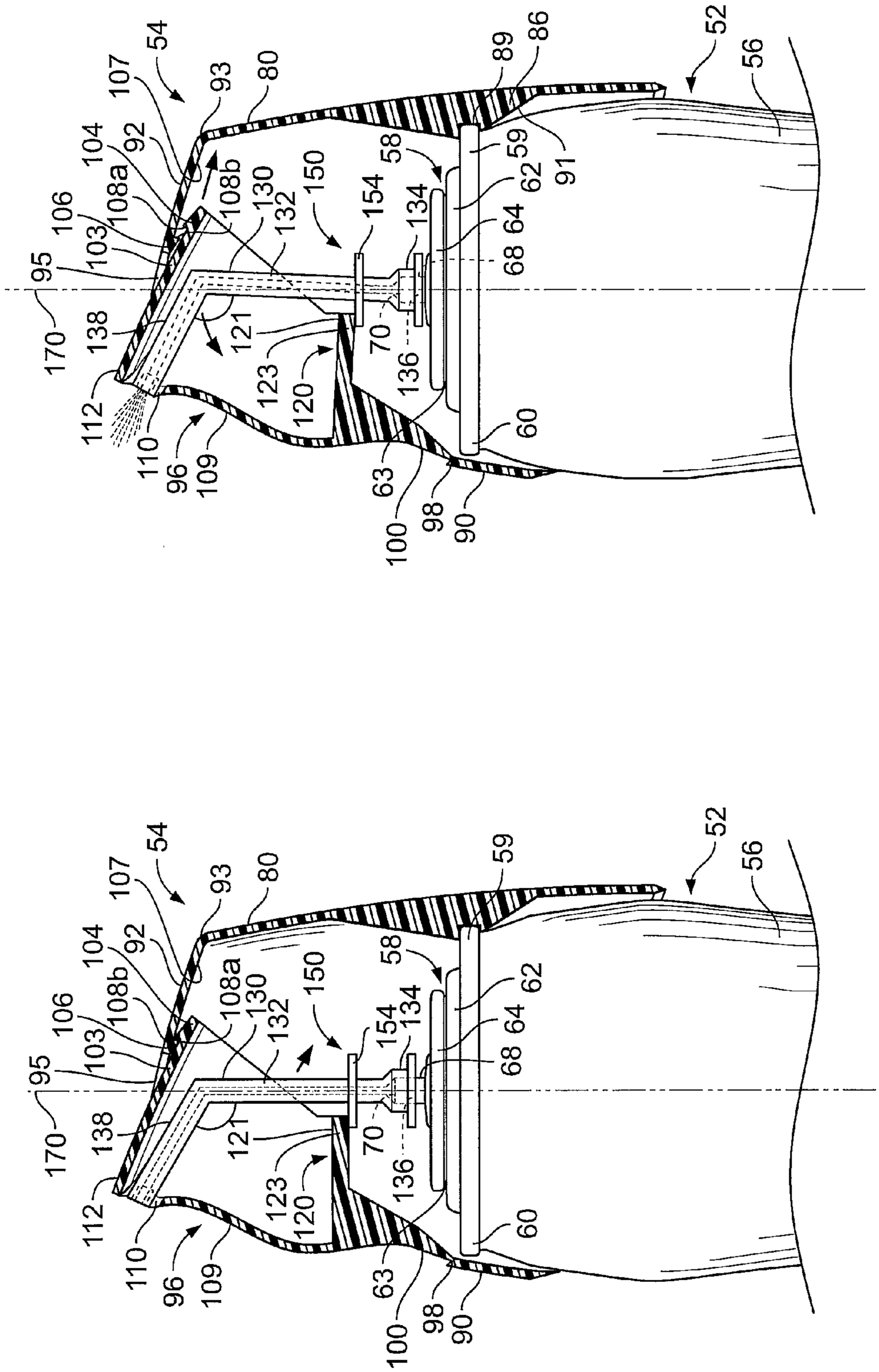


FIG. 11B

FIG. 11A

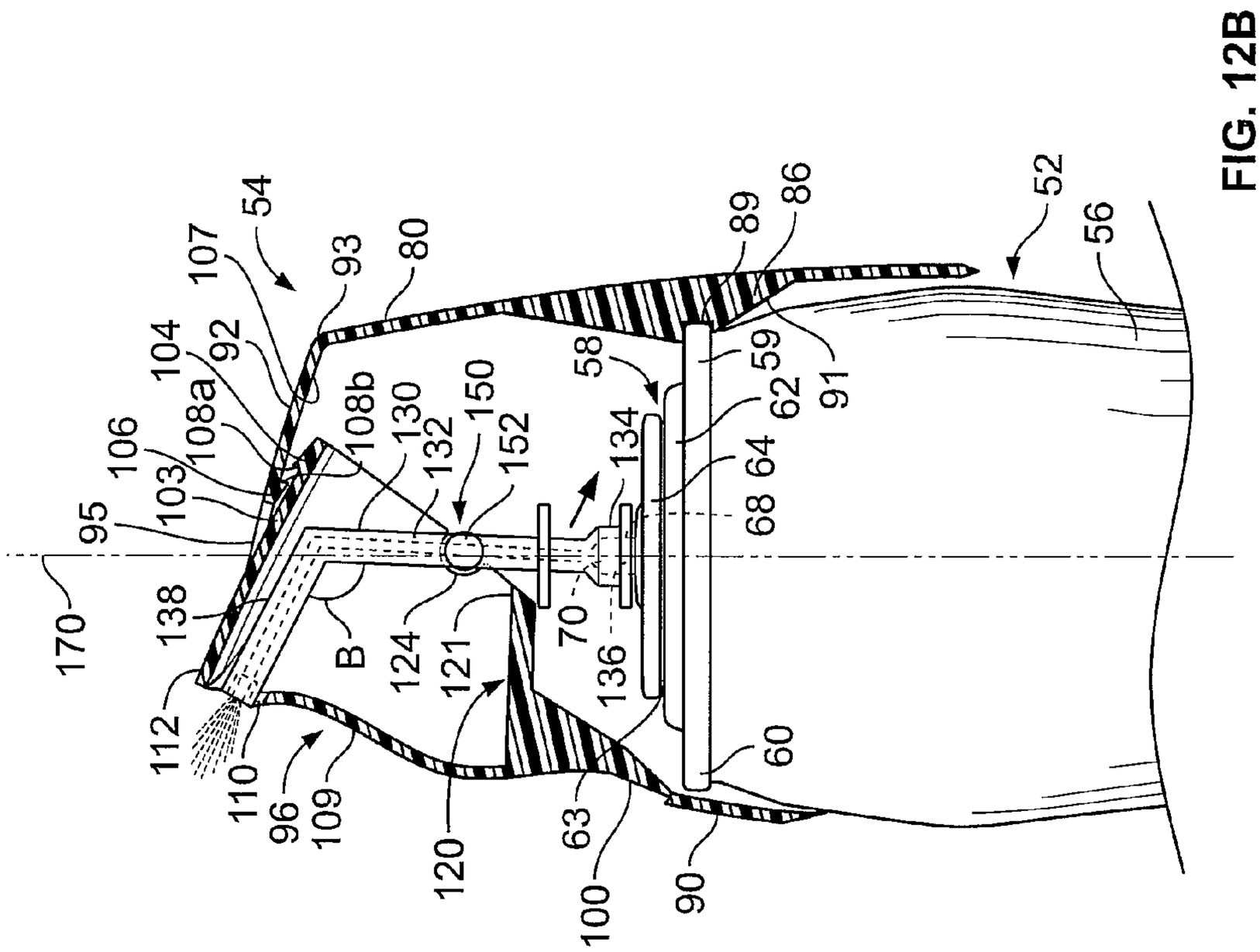


FIG. 12B

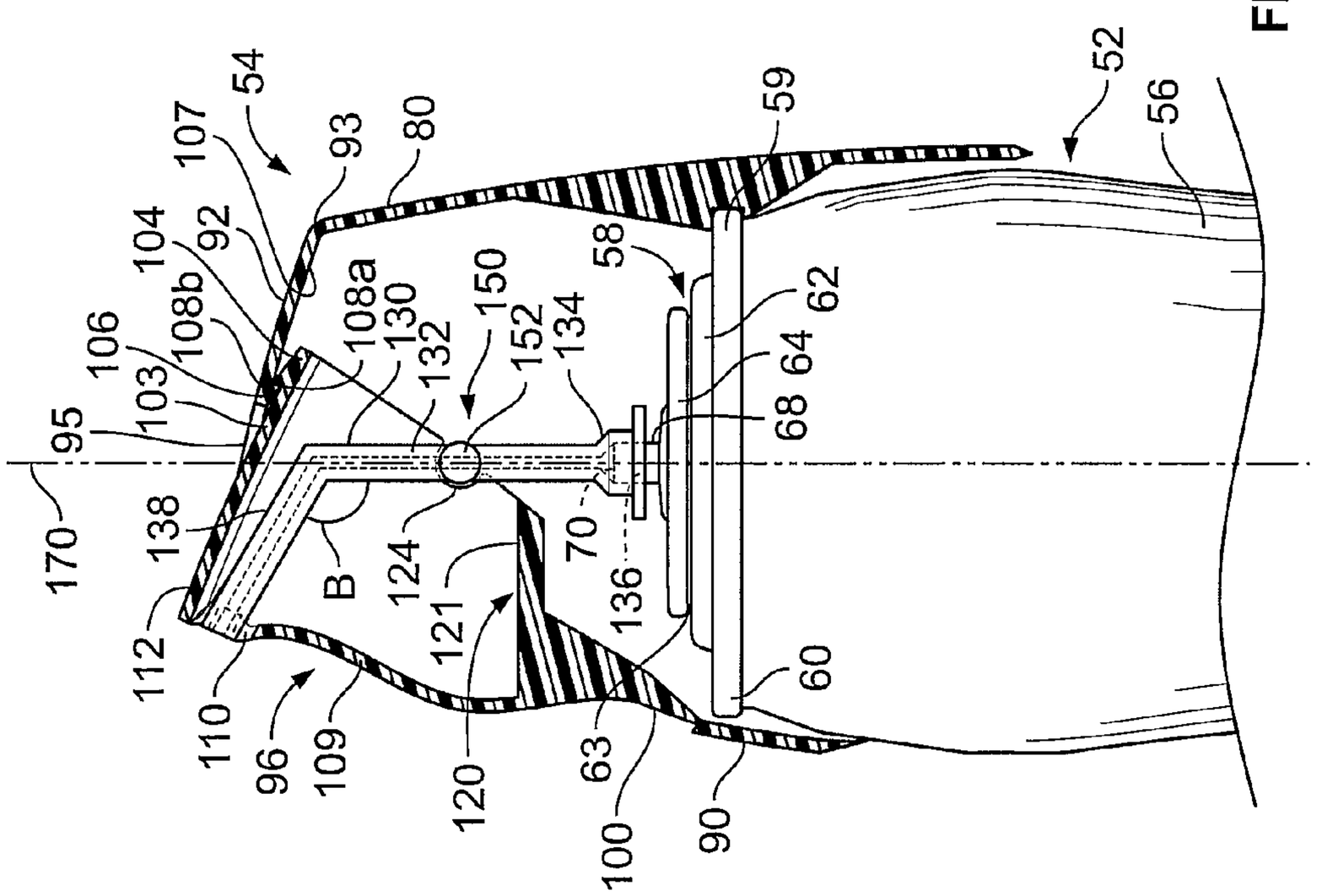


FIG. 12A

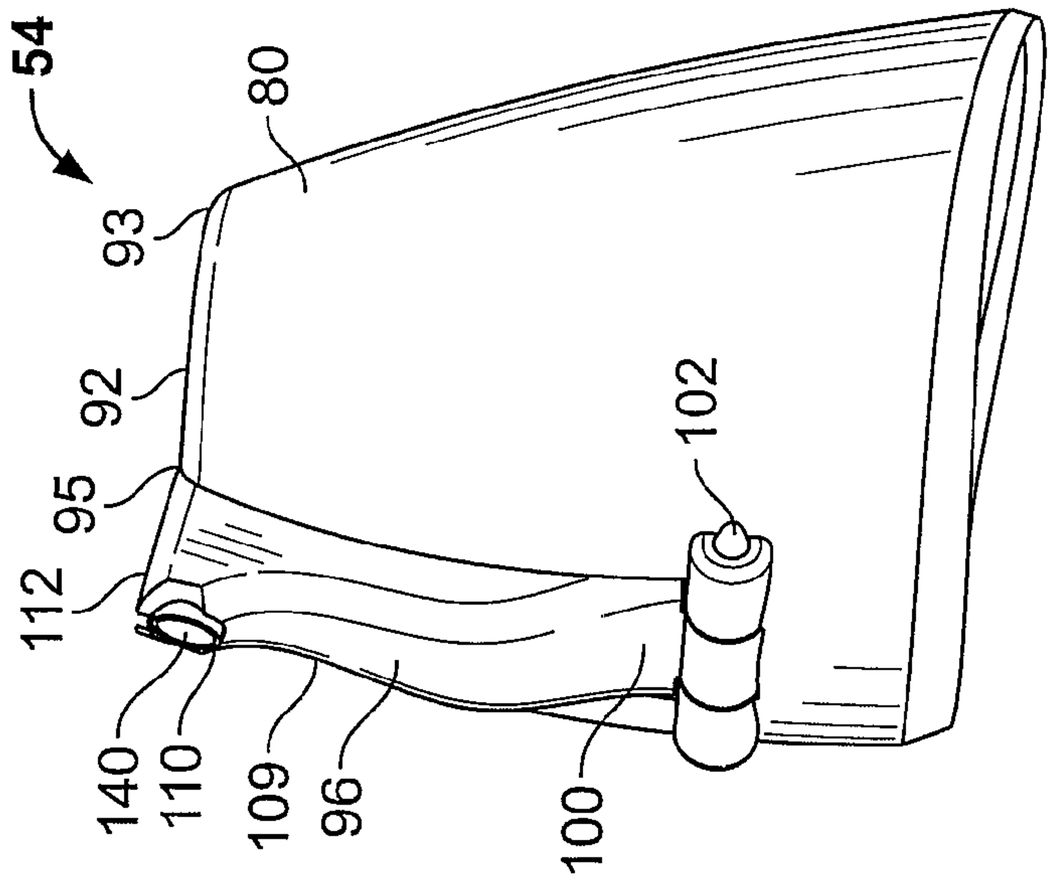
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FIG. 14

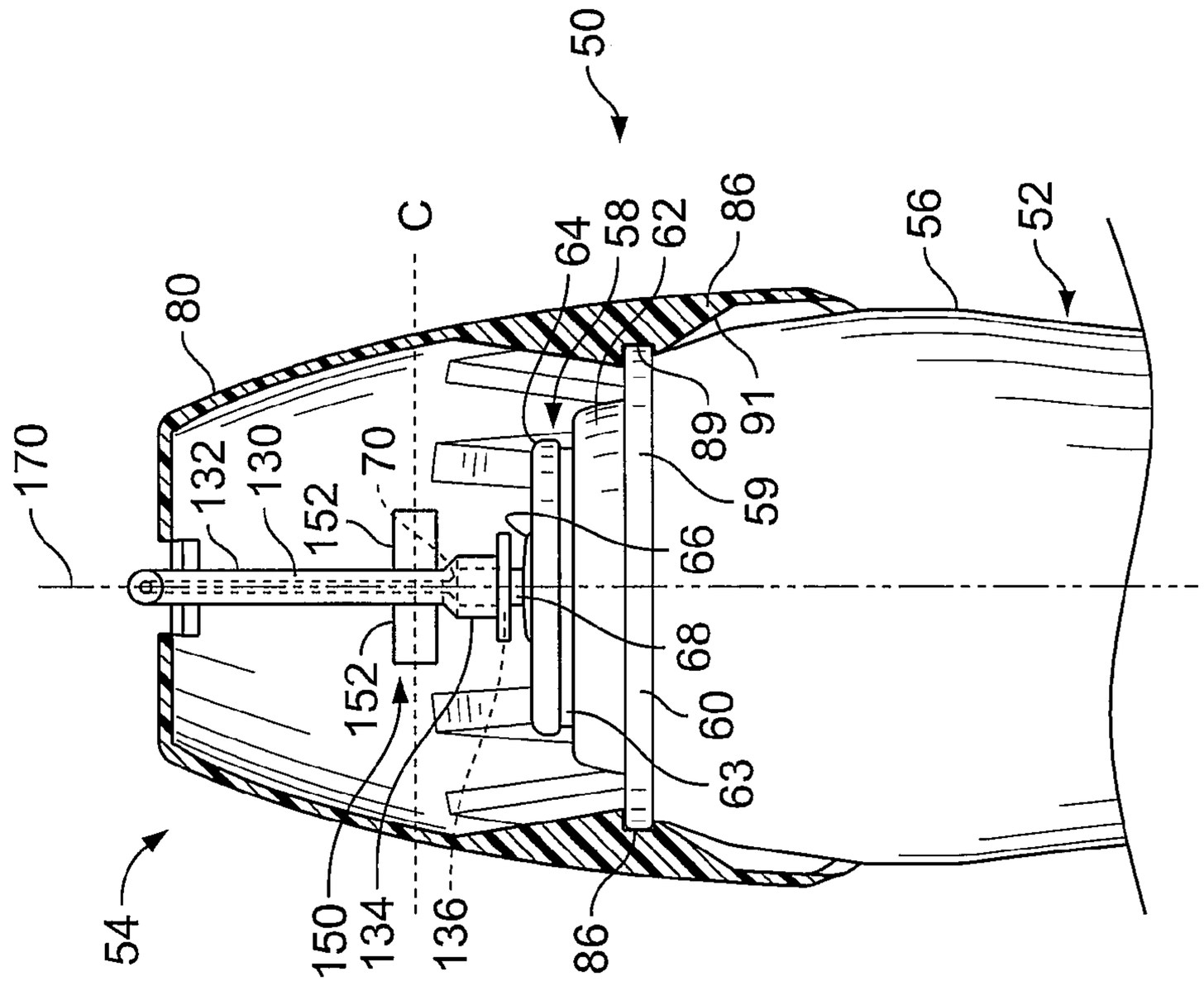
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FIG. 13

# OVERCAP FOR AND A METHOD OF ACTUATING A VOLATILE MATERIAL DISPENSER

## CROSS REFERENCE TO RELATED APPLICATIONS

Not applicable

## REFERENCE REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not applicable

## SEQUENTIAL LISTING

Not applicable

## BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to an overcap for a volatile material dispenser, and more particularly, an overcap to aid in dispensing contents from the dispenser.

2. Description of the Background of the Invention

Volatile material dispensers generally include a container where a material in the form of a fluid or other viscous state is stored and an overcap having an actuator or trigger for dispensing the fluid from the container in aerosol or other form. A valve-connecting portion is fluidly connected to a valve stem that extends from the container, wherein the valve-connecting portion provides a path of travel for fluid to exit the container. The actuator is generally connected to or disposed adjacent the valve-connecting portion such that downward pressure on the actuator and/or the valve-connecting portion actuates the valve stem to dispense the fluid upwardly. This downward motion is oftentimes difficult for the elderly or for those persons with disabilities, such as arthritis.

In some instances, an aerosol container in the form of a pressurized product dispenser includes a valve mechanism at the top of the container for discharging product upwardly and a valve actuation lever pivotally connected to the valve mechanism. The valve actuation lever extends parallel to a longitudinal axis of the container. Pressure may be applied to the lever such that the lever actuates the valve mechanism, thereby releasing pressurized product from within the dispenser.

In another instance, an overcap for attachment to an aerosol container includes a housing having a generally rectangularly-shaped opening therethrough, a separately molded L-shaped trigger portion adapted to be inserted into the housing through the opening, a tube connected to a valve stem of the container and having a channel therethrough, and a nozzle disposed at an end of the tube. The trigger, the tube, and the nozzle are disposed within the housing and the housing is covered by a cap that acts to close the housing off from the ambient environment. Pressure is applied to the trigger, thereby putting pressure on the tube and displacing the tube to result in the dispensing of liquid product in aerosol form from the container.

A further dispenser includes a reservoir having an actuator stem, a cap-shaped push button, and a retaining ring. The retaining ring is connected to the push button by one or more swivel joints and/or several movable tabs so as to allow upward and downward movement of the push button. The tabs are joined to the retaining ring or push button, wherein a first end of each tab is situated in a plane that is perpendicular



to a longitudinal axis of the reservoir and contains the axis of the swivel joint and a second end of each tab is joined to the push button. When the push button is depressed downwardly, a pin extending downwardly from the push button contacts the actuator stem to release the material contained within the reservoir.

## SUMMARY OF THE INVENTION

According to one aspect of the present invention, an overcap for a volatile material dispenser includes a housing adapted to be mounted on a container having a valve stem with a discharge end. The overcap further includes a valve-connecting portion adapted to engage the valve stem and a fixture that extends from the valve-connecting portion. Still further, the overcap includes a trigger attached to the housing by a hinge, wherein the hinge is disposed at or below a plane formed by the fixture. A contact portion is disposed in the trigger for interacting with the fixture and applying pressure to the valve-connecting portion to actuate the valve stem.

According to a further aspect of the present invention, an overcap for a volatile material dispenser includes a housing adapted to be mounted on a container having a valve stem with a discharge end. The overcap includes a valve-connecting portion adapted to engage the valve stem and a fixture that extends from the valve-connecting portion. The overcap further includes a trigger having a first end and a second end. The trigger includes a contact portion that engages the fixture to actuate the valve stem, a hinge that integrally attaches the first end of the trigger to the housing, and a one-way snap that attaches the second end of the trigger to the housing.

In yet another aspect of the present invention, a method of actuating a volatile material dispenser includes the step of providing a volatile material dispenser. The dispenser includes a housing adapted to be mounted on a container having a valve stem with a discharge end, a valve-connecting portion adapted to engage the valve stem, a fixture extending from the valve-connecting portion, a trigger integrally attached to the housing at or below a plane formed by the fixture, and a contact portion disposed in the trigger. The method further includes the step of pressing the trigger in a direction generally parallel to the plane defined by the fixture, such that the trigger movement allows the contact portion to interact with the fixture to thereby displace the valve-connecting portion.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an exploded side elevational view of a volatile material dispenser with an overcap removed therefrom;

FIG. **2** is a bottom isometric view of the overcap of FIG. **1** with portions thereof cut out to depict an inner ledge thereof,

FIG. **3** is a front elevational view of the overcap of FIG. **1**;

FIG. **4** is a fragmentary isometric view of a portion of the overcap of FIG. **1**, wherein the trigger has been omitted for clarity;

FIG. **5** is a top isometric cross-sectional view of the overcap of FIG. **1** taken generally along the lines of **5-5** of FIG. **7**, wherein the trigger is shown in an open position;

FIG. **6** is a top isometric cross-sectional view of the overcap of FIG. **1** taken generally along the lines of **6-6** of FIG. **7**, wherein the trigger is shown in a closed position;

FIG. **7** is a top plan view of the overcap of FIG. **1**;

FIG. **8**A is a top isometric view of a first embodiment of the trigger;

FIG. **8**B is a top isometric view of a second embodiment of the trigger

FIG. **9** is a top isometric view of a third embodiment of the trigger;

FIGS. **10**A-C are cross-sectional views of the overcap of FIG. **1** taken generally along the lines **10-10** of FIG. **7** and embodying the trigger of FIG. **8**B with portions behind the cross-sectional plane omitted and the dispenser and a valve-connecting portion shown in full front elevation for clarity, wherein the overcap is shown in the open, closed, and actuated positions, respectively;

FIGS. **11**A and **11**B are cross-sectional views of the overcap of FIG. **1** taken generally along the lines **11-11** of FIG. **7** and embodying the trigger of FIG. **8**A with portions behind the plane omitted and the dispenser and a valve-connecting portion shown in full front elevation for clarity, wherein the overcap is shown in the closed and actuated positions, respectively;

FIGS. **12**A and **12**B are cross-sectional views of the overcap of FIG. **1** taken generally along the lines **12-12** of FIG. **7** with portions behind the cross-sectional plane omitted and the dispenser and a valve-connecting portion shown in full front elevation for clarity, wherein the overcap is show in the closed and actuated positions, respectively;

FIG. **13** is cross-sectional view of the overcap of FIG. **10** taken along the lines of **13-13** of FIG. **7** with portions behind the plane omitted and the dispenser and a valve-connecting portion shown in full front elevation for clarity; and

FIG. **14** is a bottom isometric view of a further embodiment of an overcap.

Other aspects and advantages of the present invention will become apparent upon consideration of the following detailed description, wherein similar structures have similar reference numerals.

## DETAILED DESCRIPTION

The present invention is directed to apparatuses and methods for aiding in actuating a volatile material dispenser. While the present invention may be embodied in many different forms, several specific embodiments are discussed herein with the understanding that the present disclosure is to be considered only as an exemplification of the principles of the invention, and it is not intended to limit the invention to the embodiments illustrated. For example, where the invention is illustrated herein with particular reference to an aerosol container, it will be understood that any other pressurized or non-pressurized container, such as, for example, any package, usually a metal can or plastic bottle, designed to dispense the contents thereof as a mist or foam, may be, if desired, substituted in whole or in part for the aerosol container in the apparatuses and methods herein described.

Referring to the drawings, FIG. **1** depicts one type of a volatile material dispenser **50** that comprises a container **52**. An overcap **54** is mounted on the container **52** for dispensing contents from the container **52** (the overcap **54** is shown mounted on the container **52** in FIGS. **10**A-**10**C, **11**A, **11**B, **12**A, **12**B, and **13**). The container **52** is a typical aerosol container known in the art. The container **52** includes a body **56** that extends upwardly from a base portion **57** and tapers inwardly toward a closure **58** that encloses the contents of the container **52**. The closure **58** includes a lower annular bead or ledge **59** that forms a lower end **60** of the closure **58**. The lower bead **59** is crimped over a top end of the body **56** of the container **52**, wherein material forming the lower bead **59** further forms a central portion **62** that is disposed inwardly of the lower bead **59** and extends upwardly from the lower end **60** of the closure **58**. The central portion **62** includes an annular groove **63** that leads into an upper annular bead or ledge **64**. A valve stem **68** extends upwardly from the closure **58** and includes a discharge end **70**, wherein the contents of the dispenser may be dispensed therethrough. The valve stem **68** may be a vertical action or tilt action valve stem **68**. Although the container **52** is described in detail herein, the overcap **54** may be utilized with any other container known in the art.

The container **52** may contain any type of material adapted to be dispensed. For example, the container **52** may include cleaners, shave gels, air fresheners or deodorizers, insect repellant, or any other material. The material may be in concentrate form and/or mixed with other components, such as, for example, a propellant. Any type of propellant known to those in the art may be used with and/or without the material. Other additives may also be included, such as, for example, fragrances, sunscreen, moisturizers, and/or preservatives.

A first embodiment of an overcap **54** adapted for use with the container **52** is depicted generally in FIGS. **2** and **3**. The overcap **54** is shown as having a generally frustoconical shape, but also may be any other shape including a shape that may or may not be complementary to the container **52**. The overcap **54** includes a housing **80** that may include an annular inner ledge **82** (shown in FIG. **2**) disposed around a lower section **84** of the overcap **54**. The overcap **54** may be attached to the container **52** by placing the overcap **54** atop the container closure **58** and pressing downwardly such that the lower bead **59** of the container **52** rides up an annular ramped surface **85** to snap into engagement with an upwardly facing surface **87** of the inner ledge **82**. In order to remove the overcap **54**, an interference between the lower bead **59** of the container **52** and the upwardly facing surface **87** of the overcap **54** must be overcome. Although the inner ledge **82** is shown as annular, the inner ledge **82** may also be segmented to retain the overcap **54** on the container **52**.

In a further embodiment, as depicted in FIGS. **4**, **5**, **6**, **10**A-**10**C, **11**A, **11**B, **12**A, **12**B, and **13**, the housing **80** of the overcap **54** includes a plurality of inwardly extending projections **86** having notches **89** formed therein. The overcap **54** is attached to the container **52** by placing the overcap **54** atop the container closure **58** and pressing downwardly such that the lower bead **59** of the container **52** rides up angled surfaces **91** forming the projections **86** to snap into engagement with the notches **89** of the overcap **54**. Although the projections **86** are depicted as discrete and separate projections, a single annular projection may alternatively be utilized. Still optionally, the overcap **54** may contain a combination of the inner ledge **82** with the upwardly facing surface **87** and/or one or more projections **86** having notches **89** formed therein to secure the overcap **54** to the container **52**.

The overcap **54** also may be secured to other parts of the container **52**, such as, for example, the upper bead **64** or some other portion of the container **52**. Other types of engagement mechanisms well-known to those in the art may also be used to secure the overcap **54** to the container **52** including engagement mechanisms that are permanent and prevent removal of the overcap **54** from the container **52** or non-permanent and do not prevent removal of the overcap **54** from the container **52**.

As best seen in FIGS. **1**, **2**, **4**, **5**, **6**, and **10**A, the housing **80** further includes an aperture **88** that is formed within a side section **90** of the housing **80** and a portion of a top section **92** of the housing **80**. As depicted in FIGS. **1**, **5**, **6**, **10**A-**10**C, **11**A, **11**B, **12**A, and **12**B, the top section **92** is shown as inclined upwardly between a first side **93** and a second side **95** of the housing **80**. Alternatively, the top section **92** may be inclined at any angle and/or not inclined.

FIGS. **1-3**, **5-7**, **10**A-**10**C, **11**A, **11**B, **12**A, and **12**B depict a trigger **96** that is integrally attached to the housing **80** by a hinge **98** located at a first end **100** of the trigger **96**. The hinge **98** is preferably a living hinge, but may also be any other type of hinge or attachment means that may act to facilitate securement of the trigger **96** to the housing **80**, while at the same time allowing rotational movement about a pivot axis (for example, axis A shown in FIGS. **2**, **3**, **5**, and **6**). The hinge **98** is integrally attached in any of the manners described herein such that the trigger **96** is permanently secured to the housing **80** and the user is unable to remove the trigger **96** from housing **80**. Optionally, as shown in FIG. **14**, a pin **102** may be used instead of and/or in combination with the hinge **98** to secure the trigger **96** to the housing **80**. Any hinge or other attachment mechanism may be used such that the first end **100** of the trigger **96** adequately engages the housing **80** at the hinge **98** and is managed throughout the static and kinetic action of the trigger **96** to ensure retention of the trigger **96** between the hinge **98** and a second end of the trigger **103** and to ensure retention of inner surfaces **108***a*, **108***b* of latches **104**, **106**, discussed in greater detail hereinafter.

Referring to FIGS. **5**, **6**, **8**A, **8**B, and **9**, the trigger **96** is substantially hollow to accommodate other pieces of the overcap **54**, as discussed in greater detail hereinafter. The trigger **96** extends outwardly from the housing **80** at an angle that is convenient for a user to grasp, and as seen in FIGS. **1**, **10**A-**10**C, **11**A, **11**B, **12**A, **12**B, and **13**, does not extend outwardly past a footprint or outermost dimension of the container **52**. One benefit of this feature is that the trigger **96** is not accidentally displaced during transit.

As shown in FIGS. **5**, **6**, **8**A, **8**B, **9**, **10**A-**10**C, **11**A, **11**B, **12**A, and **12**B, the first upwardly extending latch **104**, or other suitable securement mechanism is located at the second end **103** of the trigger **96** to facilitate securing the trigger **96** to the housing **80**. In one embodiment, during manufacture or before first use of the overcap **54**, the trigger **96** is rotated from an open position, as seen in FIGS. **5** and **10**A, to a closed position, as seen in FIG. **1-3**, **6**, **10**B, **11**A, and **12**A. As the trigger **96** is rotated to the closed position, the first latch **104** encounters the second downwardly extending latch **106** disposed on a lower surface **107** of the top section **92** of the housing **80**, thereby forcing the second end **103** of the trigger **96** and the top section **92** of the housing **80** away from one another and causing the latches **104**, **106** to ride along one another. When the first latch **104** passes the second latch **106**, the trigger **96** and top section **92** snap into a locking position in which the latches **104**, **106** abut one another to prevent outwardly movement of the trigger **96**. The latches **104**, **106** form a one-way snap feature that allows inward movement of the trigger **96**. In an unused state, the trigger **96** is biased outwardly by the hinge **98**, thereby forcing the inner surfaces **108***a*, **108***b* of the latches **104**, **106**, respectively to constantly abut one another, as seen in FIGS. **6**, **10**A-**10**C, **11**A, **11**B, **12**A, and **12**B. When a user presses inwardly on the trigger **96** in a direction that is generally perpendicular to the valve stem **68**, the first latch **104** moves inwardly away from the second latch **106**. When pressure is removed, the trigger **96** returns to its biased position in which the inner surfaces **108***a*, **108***b* of the latches **104**, **106**, respectively, abut one another. Although latches are described in detail herein, other types of one-way securement mechanisms may also be used including one or more of notches, latches, channels, wedges, and/or snaps. The latches **104**, **106** may also take any shape that prevents movement in a first direction, but allows movement in a second direction.

As best seen in FIGS. **5**, **6**, **8**A, **8**B, **9**, **10**A-**10**C, **11**A, **11**B, **12**A, and **12**B, a front portion **109** of the trigger **96** includes a discharge channel **110** therethrough to provide an outlet for the material to be dispensed from the container **52**. The discharge channel **110** is shown oriented toward a top portion **112** of the front portion **108**, but may also be located at any other point in the trigger **96**. The discharge channel **110** may be any shape that facilitates the release of the material through the trigger **96**.

The trigger **96** further includes a contact portion **120** that is located in a rear portion **121** of the trigger **96** between the hinge **98** and the first latch **104**, as shown in FIGS. **5**, **6**, **8**A, **8**B, **9**, **10**A-**10**C, **11**A, **11**B, **12**A, and **12**B. Illustratively, the contact portion **120** is shown approximately at a mid-point between the hinge **98** and the latch **104**, but may also be located at any other point in the trigger **96**. In some embodiments, the contact portion **120** is in the form of a ledge **122** that extends outwardly from the rear portion **121** of the trigger **96**. As shown in FIGS. **8**A, **11**A, and **11**B, the ledge **122** extends in a substantially perpendicular manner from the trigger **96** and is formed of a single solid protrusion **123**. Further, FIGS. **5**, **6**, **8**B, and **10**A-**10**C depict the contact portion **120** formed of two solid protrusions **123***a*, **123***b*.

The contact portion **120** of FIGS. **9**, **12**A, and **12**B is in the form of at least one notch **124** formed in the trigger **96**. The notch **124** extends inwardly from the rear portion **121** of the trigger **96** toward the front portion **108** of the trigger **96**. The notch **124** is depicted as a semi-circular-type cutout in the trigger **96**, but also may be a square-shaped cutout, or any other polygonal-shaped cutout that is compatible with a valve-connecting portion **130**, as discussed hereinbelow.

Turning now to FIGS. **10**A-**10**C, **11**A, **11**B, **12**A, **12**B, and **13**, the overcap **54** further includes a valve-connecting portion **130**. The valve-connecting portion **130** includes a vertically extending elongate tube portion **132** with a flared end **134** forming an opening **136** that is adapted to engage the valve stem **68**. The valve-connecting portion **130** further includes a diagonally extending elongate tube portion **138** integrally formed with the vertically extending tube portion **132** such that fluid can travel through both tube portions **132**, **138**. The diagonally extending tube portion **138** extends to a point adjacent the discharge channel **110** of the trigger **96**, wherein a nozzle **140** inserted into the discharge channel **110** or an need of the diagonally extending tube portion **138** is fluidly coupled to the tube portion **138**. As shown in FIG. **10**A, **10**B, and **10**C, an angle B is formed between the tube portions **132**, **138**, wherein the angle B is manufactured so that the valve-connecting portion **130** fits inside of, and is complementary in shape to the trigger **96**.

As shown in FIGS. **10**A-**10**C, **11**A, **11**B, **12**A, **12**B, and **13**, the valve-connecting portion **130** further includes a fixture **150** extending therefrom. As shown in FIGS. **12**A, **12**B, and **13**, the fixture **150** may include at least one protrusion **152** attached to the valve-connecting portion **130** and extending outwardly therefrom. The fixture **150** may alternatively include an annular ledge or ring **154** attached to the valve-connecting portion **130** and extending outwardly therefrom, as seen in FIGS. **10**A-**10**C, **11**A, and **11**B. As seen in FIGS. **10**A-**10**C, **11**A, **11**B, **12**A, **12**B, and **13**, the fixture **150** extends generally perpendicularly from the valve-connecting portion **130**, but may alternatively extend at an incline. The fixture **150** may or may not be integrally manufactured with the valve-connecting portion **130**. The fixture **150** is disposed adjacent to or spaced slightly from the flared end **134** of the valve-connecting portion **130**.

Pressing the trigger **96** inwardly toward the container **52** starts the actuation process in order to dispense fluid housed in the container **52**. The trigger **96** is pressed in a direction generally parallel to a plane defined by the fixture **150**. For

example, in FIG. **13**, the trigger **96** may be pressed inwardly in a direction substantially parallel to a plane C. Pressing the trigger **96** inwardly causes the trigger **96** to rotate about the hinge **98** and move inwardly, thereby causing the first latch **104** to move inwardly away from the second latch **106**. In one embodiment, as the trigger **96** moves inwardly, the contact portion **120** in the rear portion **121** of the trigger **96** contacts the fixture **150**, thereby causing downward pressure on the fixture **150**. Downward pressure on the fixture **150** is transferred to the valve-connecting portion **130**, which pressure is thereafter translated into a downward and sideways movement of the valve stem **68** to actuate same. Specifically, referring to FIGS. **10**A-**10**C, in which the contact portion **120** is in the form of two solid protrusions **123***a*, **123***b* (only **123***b* can be seen in FIGS. **10**A-**10**C) and the fixture **150** is in the form of an annular ring **154**, the protrusions **123***a*, **123***b* contact edges of the annular ring **154** to cause downward movement of the valve-connecting portion **130** and actuation of the valve stem **68**. Similarly, in FIGS. **11**A and **11**B, the ledge **122** of the trigger **96** presses downwardly on the annular ring **154** of the valve-connecting portion **130** to actuate the valve stem **68**. Alternatively, in FIGS. **12**A and **12**B, the at least one notch **124** contacts the at least one protrusion **152** to cause actuation of the valve stem **68**.

In other embodiments, the trigger **96** may contact the fixture **150** at other points that could cause actuation of the valve stem **68**. For example, the trigger **96** may contact the fixture **150** at a point that causes sideways pressure on the fixture **150**. In such an embodiment, a tilt-type valve stem **68** known in the art may be used in conjunction with the valve-connecting portion **130**.

Although the fixture **150** is described herein as an annular ring **154** or at least one protrusion **152**, alternative shapes and designs may be utilized. For example, the annular ring **154** may alternatively be, for example, circular, square-shaped, ovular, triangular, or any other polygonal shape. Further, the at least one protrusion **152** may be circular, square-shaped, triangular, or any other polygonal shape in cross-section. The fixture **150** may take any form so long as it provides an interaction point for the contact portion **120** of the trigger **96** to facilitate actuation of the valve stem **68**.

Once the valve stem **68** is actuated, aerosolized material moves upwardly in a direction substantially parallel to a longitudinal axis **170** of the container **52** and out the valve stem **68**. Material thereafter moves through the vertically and diagonally extending tube portions **132**, **138** of the valve-connecting portion **130** and is dispensed through the nozzle **140** disposed in the discharge aperture **110** in the trigger **96** or the tube portion **138** of the valve-connecting portion **130**. The nozzle **140** is separate from the trigger **96** and valve-connecting portion **130**, but may alternatively be integral with the trigger **96** and/or valve-connecting portion **130**.

In other embodiments of the present invention, the apparatuses, methods, and combinations are directed to assisting a user in operating a trigger **96** of the present invention. For example, one or more exterior sidewalls and/or portions of the overcap **54** and/or trigger **96** may be shaped to assist a user in gripping the volatile material dispenser **50**. Such shapes include, for example, a concave shape (for example, U-shaped) and/or a convex shape, and/or an S-shape. Additionally, one or more exterior side walls or portions of the overcap **54** and/or trigger **96** may include one or more ribs, bulges, bumps, knobs, protrusions, distensions, and/or protuberances to assist a user in gripping one or more areas of the trigger **96**. Illustratively, these gripping assists may be in any pattern, including, for example, horizontal, vertical, curved, serpentine, zigzag, and/or diagonal, to assist a user in gripping the overcap **54** and/or trigger **96**. Combinations of the above gripping assists may also be used in the present invention.

Two or more parts and/or surfaces described herein may be attached together in a permanent or non-permanent manner by any fastening, securing, and/or joining techniques known to those skilled in the art. Examples include mechanically, chemically, and/or heat fastening, securing, and/or joining together two or more surfaces of metal, plastic, glass, rubber, paper, and/or ceramic, and combinations thereof. A chemical agent useful in the present invention to fasten, secure, and/or join two or more surfaces together includes, for example, an adhesion promoter, a binding agent (for example, a cyanoacrylate adhesive, or an epoxy putty), a bonding agent (for example, a hot melt adhesive), a crosslinking agent, a curing agent (for example, a UV light curing adhesive), a fixative agent, a sticking agent, and/or a vulcanizing agent, and combinations thereof. Exemplary chemical agents useful in the present invention include those described in, for example, The Handbook of Industrial Chemical Additives—2nd Edition, Gower Publishing Limited (Mar. 28, 1998). Additional examples of chemical agents useful in the present invention include those described in the Merck Index, Thirteenth Edition, John Wiley & Sons, 13th edition (October 2001). Heat fastening, securing, and/or joining techniques useful in the present invention include, for example, ultrasound, heat or sonic staking, and/or laser welding or joining techniques. Mechanical techniques useful in the present invention, include, for example, the use of tabs, protrusions, hooks, clamps, fasteners, ties, fastening strips (for example, Velcro®), adhesive tape (for example, two sided tape), rivets, soldering, brazing, and/or welding, and combinations thereof. Combinations of the above fastening, securing, and/or joining techniques and agents may be used in the present invention.

The overcap **54**, trigger **96**, valve-connecting portion **130**, and/or nozzle **140** are made from any suitable material including, for example, metal, glass, rubber, paper, ceramic and/or plastic such as, for example, nylon, polypropylene, polyethylene, polystyrene, acetal, toughened acetal, polyketone, polybutylene terephthalate, high density polyethylene, polycarbonate, and/or ABS, and combinations thereof.

The overcap **54**, trigger **96**, valve-connecting portion **130**, and/or nozzle **140** may be made using any desired method known to those skilled in the art, including, for example, injection molding and/or a blow molding process. Metallurgy techniques known to those skilled in the art are also useful in the present invention in making the overcap **54**, trigger **96**, valve-connecting portion **130**, and/or nozzle **140** described herein.

Any of the embodiments described herein may be modified to include any of the structures or methodologies disclosed in connection with other embodiments.

## INDUSTRIAL APPLICABILITY

The present invention provides volatile material dispensers for aiding in dispensing a volatile material from a container. The dispensers are in the form of overcaps that are attached to a container, wherein each of the overcaps includes a trigger for actuating the dispenser to dispense the volatile material therefrom. The overcaps and triggers exhibit improved ease of use in that they are easy to grip and the user needs to exert little pressure on the trigger to dispense the volatile material therefrom.

Numerous modifications to the present invention will be apparent to those skilled in the art in view of the foregoing

description. Accordingly, this description is to be construed as illustrative only and is presented for the purpose of enabling those skilled in the art to make and use the invention and to teach the best mode of carrying out same. The exclusive rights to all modifications which come within the scope of the appended claims are reserved.

We claim:

**1**. A method of actuating a volatile material dispenser, comprising:

providing a volatile material dispenser, wherein the dispenser includes a housing having a side section depending from a top section, the housing adapted to be mounted on a container having a valve stem with a discharge end, a valve-connecting portion adapted to engage the valve stem, a fixture extending from the valve-connecting portion, a trigger having a discharge aperture, wherein the trigger is integrally attached to the housing entirely below a plane formed by the fixture and on a same side of the side section as the discharge aperture, and a contact portion disposed in the trigger; and

pressing the trigger in a direction generally parallel to the plane defined by the fixture, such that the trigger movement allows the contact portion to move into contact with the fixture to thereby displace the valve-connecting portion.

**2**. The method of claim **1**, further including the step of providing a container.

**3**. The method of claim **1**, wherein a first end of the trigger is integrally attached to the housing by a living hinge and the trigger includes a hook that attaches a second end of the trigger to the housing.

**4**. The method of claim **3**, wherein the pressing step includes the step of displacing the second end of the trigger away from the housing.

**5**. The method of claim **4**, further including the step of releasing the trigger to allow the second end of the trigger to move toward and be stopped by the hook.

**6**. An overcap for a volatile material dispenser, comprising:

a housing including a side section depending from a top section, the housing adapted to be mounted on a container having a valve stem with a discharge end;

a valve-connecting portion adapted to engage the valve stem;

a fixture extending from the valve-connecting portion;

a trigger attached to the side section of the housing by a hinge, wherein the hinge is entirely disposed below a plane formed by the fixture and the hinge is disposed on a same side of the side section of the housing as a discharge aperture; and

a contact portion disposed in the trigger for moving into contact with the fixture and applying pressure to the valve-connecting portion to actuate the valve stem.

**7**. The overcap of claim **6**, wherein the fixture extending from the valve connecting portion comprises at least one protrusion.

**8**. The overcap of claim **7**, wherein the contact portion disposed in the trigger comprises at least one notch.

**9**. The overcap of claim **6**, wherein the fixture extending from the valve-connecting portion comprises an annular ring.

**10**. The overcap of claim **9**, wherein the contact portion disposed in the trigger comprises a ledge extending therefrom.

**11**. The overcap of claim **6**, wherein the hinge is a living hinge.

**12**. The overcap of claim **6**, wherein the trigger is integrally attached to the housing.

**13**. The overcap of claim **6**, wherein the valve-connecting portion extends to a point adjacent the discharge aperture of the trigger.

**14**. The overcap of claim **1**, in combination with a container.

**15**. An overcap for a volatile material dispenser, comprising:

a housing having a side section depending from a top section, the housing adapted to be mounted on a container having a valve stem with a discharge end;

a valve-connecting portion adapted to engage the valve stem;

a fixture extending from the valve-connecting portion;

a trigger having a portion extending outwardly from the side section of the housing, the portion of the trigger having a discharge aperture, wherein the trigger is integrally attached to the housing below a plane formed by the fixture; and

a contact portion on the trigger for moving into contact with the fixture to thereby displace the valve-connecting portion.

**16**. The overcap of claim **15**, wherein the trigger is integrally attached to the housing by a living hinge.

**17**. The overcap of claim **15**, wherein the trigger comprises at least one of a concave shape, convex shape, and an S-shape.

**18**. The overcap of claim **15**, in combination with a container.

**19**. The overcap of claim **15**, wherein the housing is inclined upwardly between a first side and a second side thereof.

**20**. The overcap of claim **15**, wherein the housing includes an aperture formed within the side section of the housing.

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